Cancer Incidence in Virginia
1997

Virginia Department of Health
E. Anne Peterson, MD, MPH
Commissioner

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Virginia Cancer Registry
Division of Surveillance and Investigation
Office of Epidemiology
P.O. Box 2448, Room 114
Richmond, Virginia 23218

http://www.vdh.state.va.us/epi/cancer/index.htm
TEL (804) 786-1668
FAX (804) 371-4061

Produced by the Virginia Cancer Registry

Dawn S. Hawkins, MS
Statistical Analyst, Senior

Contributing Editors

Amy M. Pugh, MA
Director, Virginia Cancer Registry

C. Diane Woolard, PhD, MPH
Director, Division of Surveillance and Investigation

Virginia Cancer Registry Staff

Bonita B. Bryant, CTR
Quality Assurance Coordinator

Mary Dianne Collins, RHIT, CTR
Cancer Surveillance Specialist

Christine V. Hunsucker, CTR
Cancer Surveillance Specialist

Blanche N. Perry, RHIT, CTR
Cancer Surveillance Specialist

Leona C. Rowe, CTR
Cancer Surveillance Specialist

Vivian C. Purnell
Program Support Technician

Morris L. Harding
Systems Network Administrator

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Section I

Introduction

What is the Virginia Cancer Registry?

The Virginia Cancer Registry (VCR) collects, analyzes, and disseminates information about the occurrence of cancer in the Commonwealth of Virginia. The Virginia Cancer Registry exists to:

- provide data for the planning and evaluation of cancer control activities,
- provide community-based information regarding cancer incidence,
- promote cancer-related research and provide data for research studies,
- provide support and training to hospital registries,
- provide guidance to hospitals seeking American College of Surgeons approval,
- educate allied health professionals, health managers, and physicians about cancer reporting and data usage.

The Virginia Cancer Registry has collected demographic and clinical information on cancer patients diagnosed or treated in Virginia since 1970. The VCR became a population-based registry in 1990 when reporting of newly-diagnosed cancer cases was made mandatory for hospitals, clinics, and pathology laboratories (*Code of Virginia* Section 32.1-70). In order to improve the completeness of case reporting to the VCR, in 1998 the Virginia legislature amended the cancer registry law to require reporting by physician offices in certain instances. As a population-based cancer registry, the VCR is dedicated to the fulfillment of its legislative intent--to accurately monitor the incidence of cancer in the Commonwealth of Virginia for the purposes of understanding, controlling, and reducing the occurrence of cancer in the state. Since 1995, additional funding for the VCR has been provided by the Centers for Disease Control and Prevention's National Program of Cancer Registries.

All confidential information received and processed by the Registry is protected from unlawful disclosure. Data are secured from unauthorized access, and published statistical reports and data summaries only provide aggregated and non-identifiable data.

The Registry employs several techniques to ensure the completeness, accuracy, comparability, and timeliness of Virginia's cancer incidence database. In order to meet national standards in these areas, ongoing internal and external activities monitor progress, highlight areas for additional focus, and provide for the continuous quality improvement of the cancer surveillance and registration program.

Cancer Prevention and Control

Illness and death due to cancer are increasingly preventable through application of growing knowledge about the causes of cancer, improved screening and early diagnostic techniques, and more effective treatment. Cancer prevention includes various types of strategies designed to reduce the disease burden. These strategies may be directed at: 1) preventing a healthy individual from developing cancer (primary prevention), or 2) detecting cancer as early as possible when it can be treated most effectively and with the fewest side effects (secondary prevention).

Primary prevention rests on the removal of lifestyle or other factors that increase the risk of developing cancer. Present knowledge suggests that major reductions in population cancer rates and in an individual's likelihood of developing cancer are achievable through primary prevention strategies. For example, the elimination of tobacco use would reduce the lung cancer death rate by over eighty-five percent and would markedly reduce rates of cancers of the oral cavity and pharynx, esophagus, bladder, kidney, pancreas, and cervix. According to the American Cancer Society, a diet that is low in fat, high in fiber, and includes five or more servings per day of fruits and vegetables is likely to reduce the risk of cancers of the colon and rectum, lung, prostate, bladder, esophagus, stomach, and other organs. Regular, moderate exercise has also shown benefits in the prevention of cancer for a number of sites. The overall health benefit of these habits makes them wise choices for cancer prevention.

Secondary prevention refers to interventions that detect emerging tumors at an early stage, when they can be treated with the best likelihood of a cure. Screening for early detection has a clear role in reducing the disease burden due to cancers of the female breast and the cervix. The effectiveness of screening for cancer of the colon and rectum and prostate cancer is being increasingly recognized. For many other cancers, however, the advisability of routine tests remains controversial and recommendations by various authorities differ. The table on the following page shows the American Cancer Society's recommendations for the early detection of cancer in persons without symptoms who have an average risk for cancer.

While individual responsibility plays an important role in cancer prevention, government agencies, non-profit organizations, health care providers, and researchers have essential roles as well. Agencies such as the Virginia Department of Health create programs that promote screening and educational activities, and assure access to personal health services. Government agencies also create policies and regulations that minimize environmental hazards such as cigarette smoke, and control occupational exposure to carcinogens. Non-profit organizations provide education to health care providers and to the public, and maintain support services for cancer patients and their families. Researchers

investigate new ways of detecting and treating cancer, and search for clues to the causes of cancer. Health care providers deliver care, perform screening tests, and educate patients and their families. The war on cancer requires collaboration between these and many other entities. The Virginia Cancer Registry provides current, accurate data on the burden of cancer in Virginians to these and many other organizations and individuals. Information provided by the

American Cancer Society Recommendations for the Early Detection of Cancer in Average Risk, Asymptomatic People

Cancer Site	Population	Test or Procedure	Frequency
Breast	Women, age 20+	Breast self-examination	Monthly, starting at age 20
		Clinical breast examination	Every 3 years, ages 20-39 Annual, starting at age 40*
		Mammography	Annual, starting at age 40
Colorectal	Men & women, age 50+	Fecal occult blood test & flexible sigmoidoscopy	Annual fecal occult blood test and flexible sigmoidoscopy at age 50; thereafter, fecal occult blood test every year and flexible sigmoidoscopy every 5 years
		-or-	
		Double contrast barium enema†	Double contrast barium enema at age 50; thereafter, every 5-10 years
		-or-	
		Colonoscopy†	Colonoscopy ever 10 years starting at age 50
Prostate	Men, age 50+	Digital rectal examination & prostate specific antigen test	Annual digital rectal examination and prostate specific antigen test should be offered to men starting at age 50‡
Cervix	Women, age 18+	Pap test & pelvic examination	All women who are, or have been, sexually active, or hove reached age 18 should have an annual Pap test and pelvic examination. After a woman has had 3 or more consecutive satisfactory normal annual examinations, the Pap test may be performed less frequently at the discretion of the physician.
Cancer-related check-up	Men & women, age 20+	Examinations every 3 years from ages 20 to 39 years and annually after age 40. The cancer-related check-up should include: Examination for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity, and skin, as well as health counseling about tobacco, sun exposure, diet and nutrition, risk factors, sexual practices, and environmental and occupational exposures.	

*Beginning at age 40, annual clinical breast examination should be performed prior to mammography.

†Digital rectal examination should be performed at the time of sigmoidoscopy, barium enema, and colonoscopy.

‡Information should be provided to men regarding potential risks and benefits of screening.

Definitions

Reportable Cancer Cases

The *Regulations for Disease Reporting and Control (1999)* define cancer as "all carcinomas, sarcomas, melanomas, leukemias, and lymphomas excluding localized basal and squamous cell carcinomas of the skin, except for lesions of the mucous membranes." Any cancer meeting this definition must be reported to the VCR. Benign tumors of the brain and central nervous system are also reportable to the VCR, as well as localized basal and squamous cell skin carcinomas greater than five centimeters at the time of diagnosis. Skin cancer diagnosed at the regional or distant stages as well as any other type of skin malignancy, such as melanomas, mycosis fungoides, and Kaposi's sarcoma, should also be reported.

Cancer Site Categories

To facilitate data interpretation and comparison, the VCR uses standard categories to analyze the site of the body in which the cancer originally began. The National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program has established these categories. Most cancers are grouped by the anatomical site (prostate, lung and bronchus, etc.), but some cancers, such as lymphomas and leukemias, are grouped by their cell type. Please see Appendix B for the SEER site category definitions.

Incidence Rate

A cancer incidence rate reflects the number of new cases diagnosed per 100,000 individuals in a given area over a defined time period. Cancer rates tend to vary substantially by age, with higher rates for most cancers noted in older populations. This report provides both age-specific and age-adjusted annual incidence rates. Age-specific rates denote the incidence of cancer among persons within specific age categories (typically 0-4 years, 5-9 years, 10-14 years, etc., up to 85+ years). Age-adjusted rates are calculated by mapping age-specific rates onto a standard population to remove the effect of different age structures and to arrive at a single summary measure that may be used for comparison. All age-adjusted incidence rates were calculated by the direct method, using the age distribution of the 1970 United States population as the standard (See Appendix C). Rates were calculated by sex, race, and stage at diagnosis. Annual race-, sex-, and age-specific county population estimates from the U.S. Census Bureau (1999 release) were summed to produce population-at-risk figures (see Appendix D). *Except where noted, all incidence rates are expressed per 100,000 persons per year and exclude in situ carcinomas except urinary bladder.*

Mortality Rate

A cancer mortality rate reflects the number of deaths due to cancer per 100,000 individuals in a given area over a defined time period. Cancer death

rates also tend to vary substantially by age, with higher rates for most cancers noted in older populations. This report provides the age-adjusted mortality rates for selected types of cancer. Mortality rates were age-adjusted by the same method used for incidence rates. Except where noted, all mortality rates are expressed per 100,000 persons per year and exclude in situ carcinomas except urinary bladder. Age-adjusted mortality rates were calculated using data obtained from the Virginia Center for Health Statistics.

Summary Stage

A cancer stage identifies how far a malignant tumor has spread from the site of origin at the time of diagnosis. Identifying the stage of cancer at diagnosis is useful in evaluating prognosis and choosing treatment. In this publication, stage is categorized according to the following summary stage convention:

- In situ – A malignant tumor that does not invade or penetrate surrounding tissue.
- Localized – An invasive tumor confined to the site of origin.
- Regional – A tumor that has spread by direct extension to immediately adjacent organs or tissues and/or metastasized (spread through the bloodstream) to regional lymph nodes, but appears not to have spread any further.
- Distant – A tumor that has spread by direct extension beyond the immediately adjacent organs or tissues, and/or metastasized to distant lymph nodes or other distant tissues.
- Unstaged – Insufficient information available to determine the stage of disease at diagnosis.

Stage distributions, including in situ cancers, are provided for selected sites in Section III. Cancers staged as local, regional, or distant are commonly referred to as "invasive." This report focuses on invasive cancer but does include in situ cancer of the bladder. Section IV provides additional data on incidence by stage at diagnosis.

Race and Ethnicity Grouping

The Virginia Cancer Registry collects specific information on race and ethnicity. Such detail is not readily available from all reporting sources, however, and many groups are undercounted or misclassified. Therefore, cancer incidence statistics may be incomplete for certain specific racial and ethnic groups and may not accurately reflect the true cancer burden in these populations. Due to these limitations, race-specific rates in this report are calculated for Whites, Blacks, and all other races combined. According to the modified 1990 U.S. Census data of September 1999, 76.0% of Virginia's population was White, 20.1% Black, and 3.9% was of another race, including Asian/Pacific Islander and Native American/Alaskan Native. Note that persons of Hispanic ethnicity may of any race.

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Section II

Incidence of Reportable Cancer in Virginia:

An Overview

Overview

This publication is based on cancers diagnosed in Virginia residents during 1997 and reported to the VCR. All data are provisional, as facilities may continue to report additional cases diagnosed during 1997. Information is provided for all cancer sites combined and for the ten most frequently reported sites of invasive cancer diagnosed in Virginia residents, including: urinary bladder, female breast, colon and rectum, kidney and renal pelvis, lung and bronchus, skin (melanoma only), oral cavity and pharynx, prostate, uterus, and non-Hodgkin's lymphoma. Although cervical cancer is not among the top ten sites, it is included due to the strong interest of the public, researchers, and policy makers. On page 17, information is provided on the incidence of other major cancer types.

During 1997, 24,287 new cases of invasive cancer were reported among Virginia residents, and the state had an age-adjusted incidence rate of 331.4 cases per 100,000 persons. The various forms of cancer were responsible for 12,850 deaths among Virginia residents in 1997 and accounted for 24% of all deaths (Virginia Center for Health Statistics). Consistent with previous years, cancer incidence was higher for males than females and blacks showed a slightly higher incidence rate than whites or persons of another race. The four most commonly diagnosed forms of cancer were female breast, lung and bronchus, prostate, and colon and rectum; together these sites accounted for over one-half of all new cancers diagnosed in 1997.

During 1997, female breast cancer was the most frequently reported cancer in Virginia residents with 4,052 cases diagnosed. In Virginia females, 1,051 deaths from breast cancer occurred, making the disease the second leading cause of cancer death among women.

Cancer of the lung and bronchus was the second most commonly reported cancer in Virginia during in 1997, with 3,832 cases diagnosed. There were 3,807 deaths from the disease during 1997, making it the most common cause of cancer death among all Virginians. The incidence rate in males was nearly double that of females.

The third most commonly reported cancer in Virginia residents was cancer of the prostate. During 1997, 3,404 residents were diagnosed with the disease, while 831 died from prostate cancer. In Virginia males, prostate cancer was the most commonly diagnosed cancer and the second leading cause of cancer death among males.

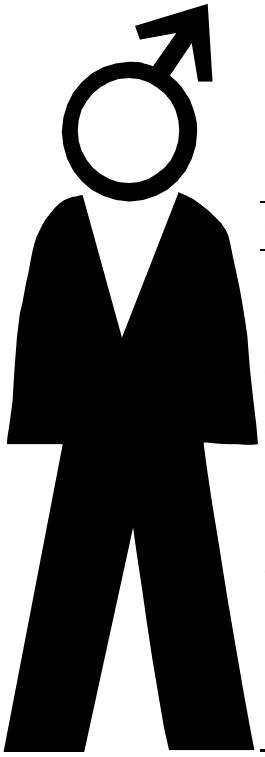
Cancer of the colon and rectum was the fourth most commonly reported cancer in Virginia residents in 1997. During the year, 2,919 Virginians were diagnosed with the disease, and 1,271 residents died from colorectal cancer. Colorectal cancer was the second leading cause of cancer death in the state.

Cancer mortality statistics from the Virginia Center for Health Statistics have been provided with the site specific incidence data. We hope you find that the change in format makes it easier to compare newly diagnosed cases to cancer deaths for each particular disease site. This year, we also have included a listing of publications and journal articles using Virginia Cancer Registry data. If you would like to receive a copy of a Virginia Cancer Registry publication, please con-

Distribution of Reported Cancer, Virginia, 1997
Number, Percentage of Cases, and Age-adjusted Incidence Rate
By Site
Total Population

SITE	Cases	%	Rate
Female Breast	4,052	*16.7*	99.8
Lung and Bronchus	3,832	*15.8*	53.4
Prostate	3,404	*14.0*	111.1
Colon and Rectum	2,919	*12.0*	39.0
Urinary Bladder	945	*3.9*	12.7
Non-Hodgkin's Lymphoma	921	*3.8*	12.4
Melanoma of the Skin	789	*3.2*	10.3
Uterus	680	*2.8*	17.1
Oral Cavity and Pharynx	667	*2.7*	9.2
Kidney and Renal Pelvis	516	*2.1*	7.1
Ovary	464	*1.9*	11.6
Pancreas	426	*1.8*	5.7
Leukemia	414	*1.7*	5.9
Stomach	365	*1.5*	4.9
Brain and Other Nervous System	322	*1.3*	4.5
Thyroid	321	*1.3*	4.1
Cervix	308	*1.3*	7.3
Esophagus	302	*1.2*	4.3
Larynx	275	*1.1*	3.8
Multiple Myeloma	228	*0.9*	3.2
Liver and Intrahepatic Bile Duct	194	*0.8*	2.7
Hodgkin's Lymphoma	182	*0.7*	2.5
Testis	136	*0.6*	3.2
Other	1,625	*6.7*	—
TOTAL	**24,287**		**331.4**

Note. Data exclude localized basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population. Percentages do not sum to 100% due to rounding.

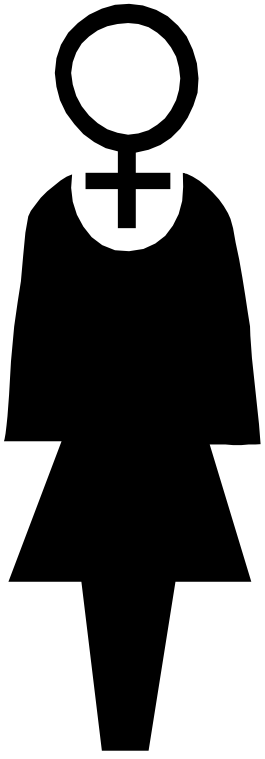


Distribution of Reported Cancer, Virginia, 1997
Number, Percentage of Cases, and Age-adjusted Incidence Rate
By Site
Ten Most Commonly Reported Sites--Males

SITE	Cases	%	Rate
Prostate	3,404	27.8	111.1
Lung and Bronchus	2,332	19.0	74.4
Colon and Rectum	1,489	12.2	47.1
Urinary Bladder	688	5.6	22.0
Non-Hodgkin's Lymphoma	500	4.1	15.1
Melanoma of the Skin	423	3.5	12.5
Oral Cavity and Pharynx	418	3.4	12.9
Kidney and Renal Pelvis	318	2.6	9.7
Leukemia	236	1.9	7.4
Larynx	228	1.9	7.2

Note. Data exclude localized basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. All rates are per 100,000 male population and are adjusted to 1970 U.S. standard population.

Distribution of Reported Cancer, Virginia, 1997
Number, Percentage of Cases, and Age-adjusted Incidence Rate
By Site
Ten Most Commonly Reported Sites--Females



SITE	Cases	%	Rate
Breast	4,052	33.7	99.8
Lung and Bronchus	1,500	12.5	37.5
Colon and Rectum	1,430	11.9	32.6
Uterus	680	5.6	17.1
Ovary	464	3.9	11.6
Non-Hodgkin's Lymphoma	421	3.5	10.1
Melanoma of the Skin	366	3.0	8.8
Cervix	308	2.6	7.3
Urinary Bladder	257	2.1	5.8
Oral Cavity and Pharynx	249	2.1	6.2

Note. Data exclude localized basal and squamous cell skin cancers and in situ carcinomas except urinary

Section III

Descriptive Epidemiology of Invasive Cancer for Selected Sites

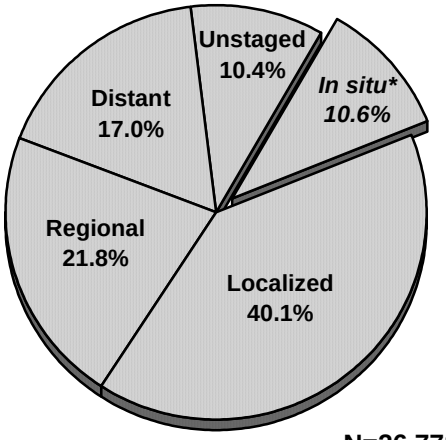
All Sites Combined

Number of Cases and Age-Adjusted Rates By Sex and Race

	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	24,287	331.4	12,850	169.9
Male	12,249	386.2	6,761	215.3
Female	12,038	293.8	6,089	139.7
White	19,374	326.0	10,037	162.0
Black	4,337	366.7	2,679	222.5
Other	404	215.0	134	78.4

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude localized basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

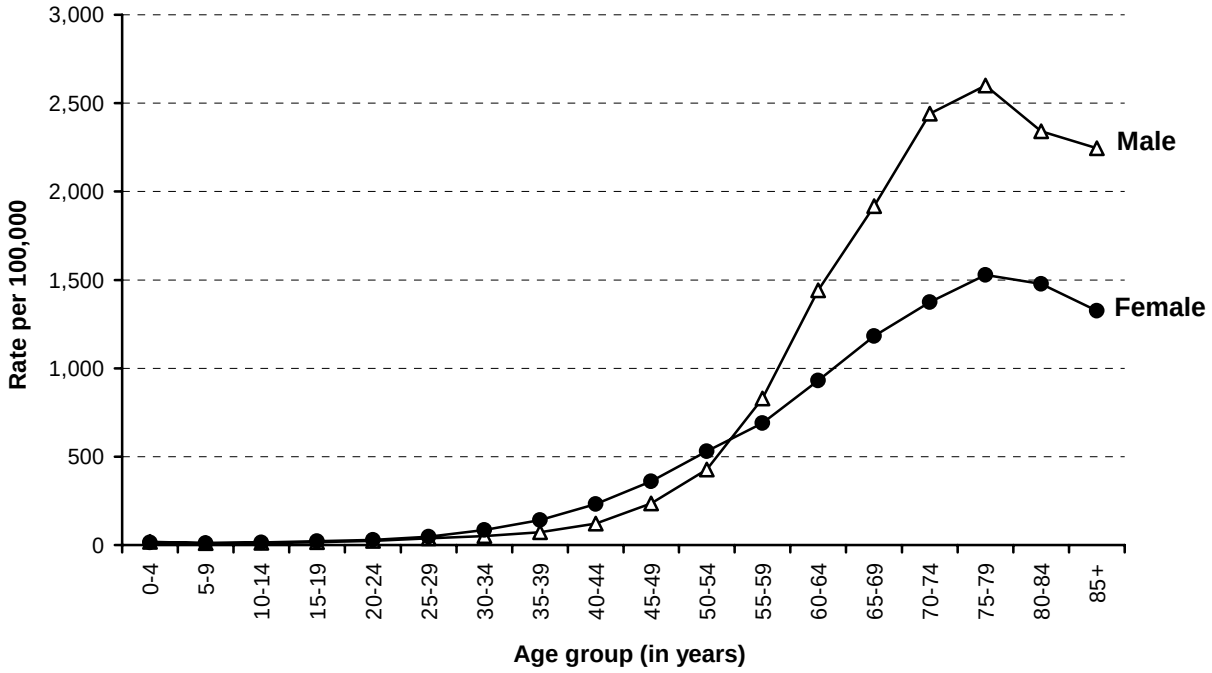
Percentage of Cases by Stage at Diagnosis for All Sites Combined



N=26,771

*In situ cancers except urinary bladder have been excluded from all rates presented.

Invasive Cancer, All Sites Combined Age-Specific Incidence Rate by Sex



Female Breast Cancer

Number of Cases and Age-Adjusted Rates By Race

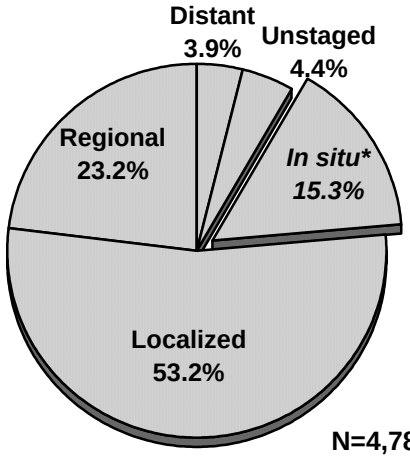
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	4,052	99.8	1,051	24.8
White	3,332	102.7	817	23.9
Black	647	92.4	226	31.8
Other	62	50.9	8	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 female population and are adjusted to 1970 U.S. standard population. An additional 44 cases of breast cancer occurred in males.

Total figures include persons of unknown race.

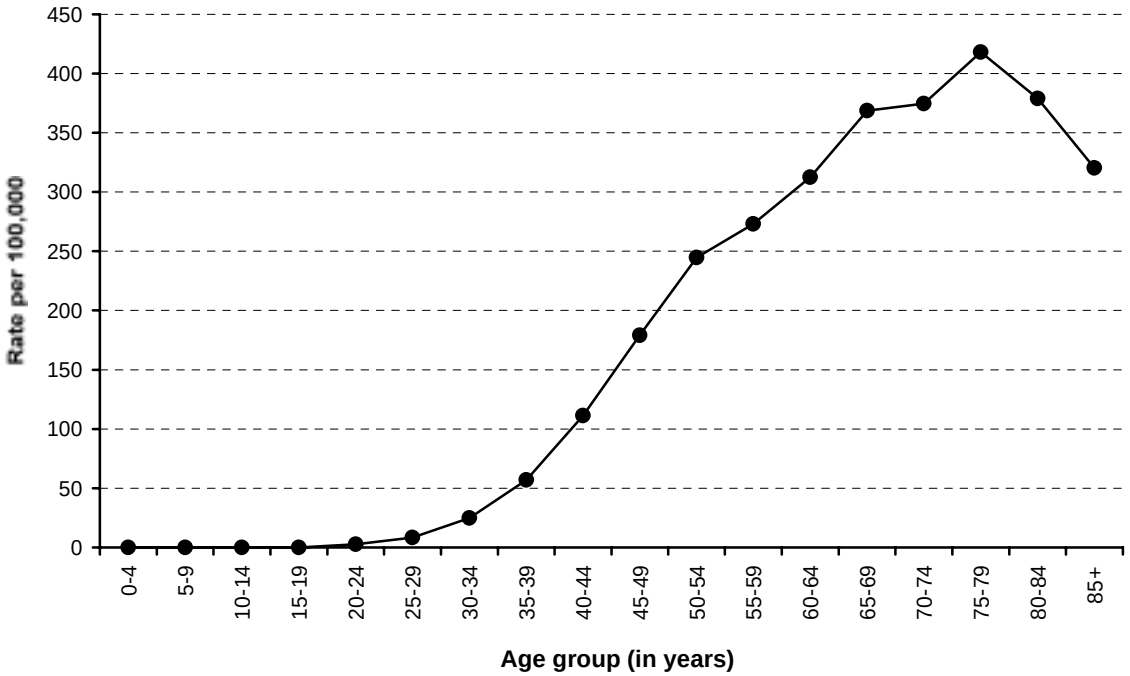
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Female Breast Cancer Age-Specific Incidence Rate



Cancer of the Cervix

Number of Cases and Age-Adjusted Rates By Race

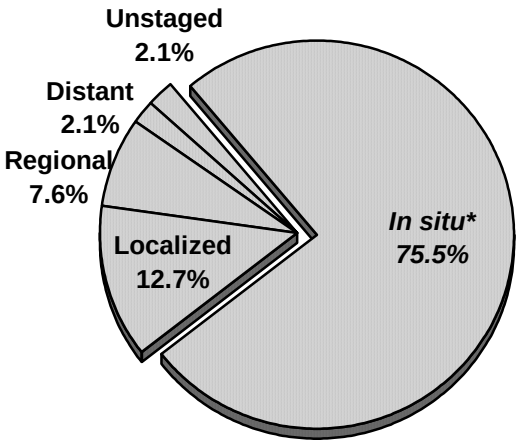
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	308	7.3	109	2.5
White	210	6.4	70	2.1
Black	81	11.1	34	4.6
Other	12	9.1	5	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 female population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

† Rates based on fewer than 10 cases are not reported because they are unreliable.

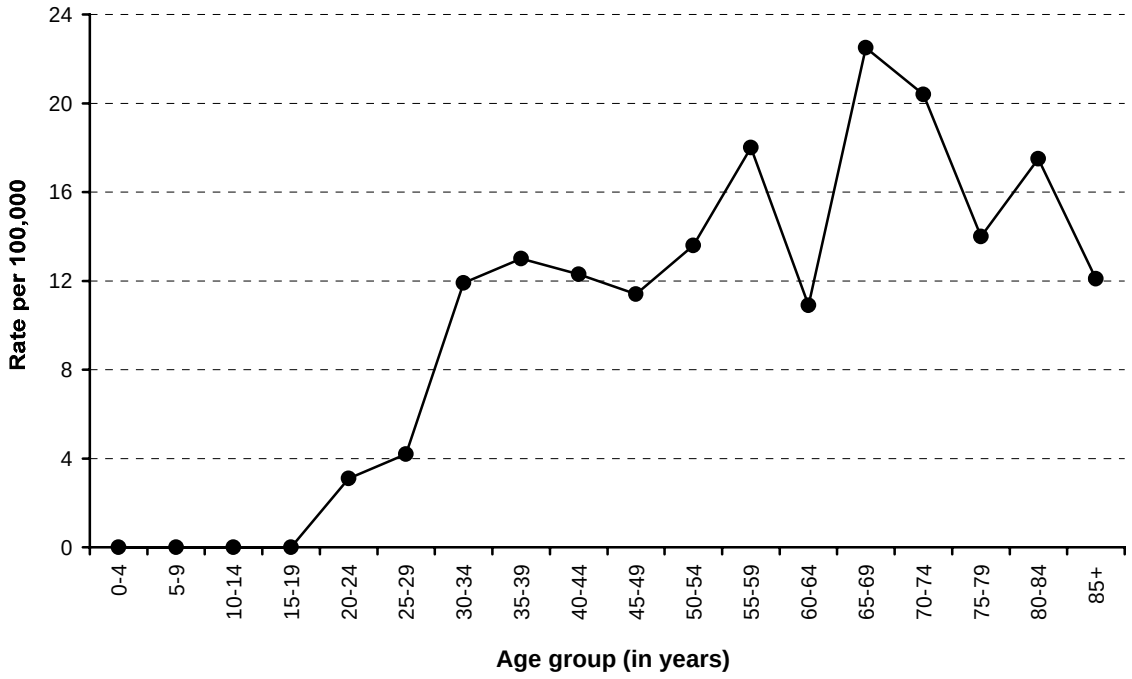
Percentage of Cases By Stage at Diagnosis



N=1,263

*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Cervix Age-Specific Incidence Rate



Cancer of the Colon and Rectum

Number of Cases and Age-Adjusted Rates By Sex and Race

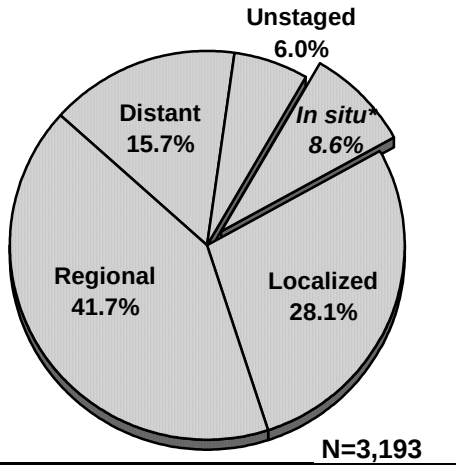
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	2,919	39.0	1,271	16.4
Male	1,489	47.1	623	19.9
Female	1,430	32.6	648	14.0
White	2,314	37.6	976	15.3
Black	557	47.2	286	23.3
Other	39	25.5	9	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

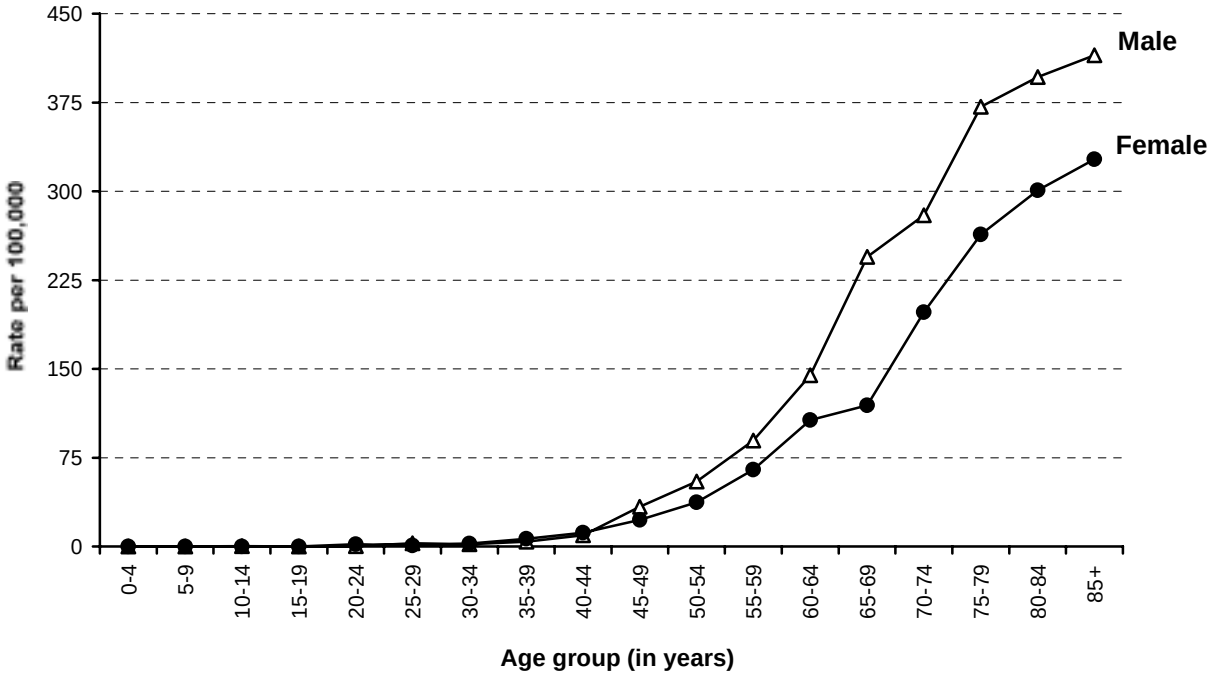
† Rates based on fewer than 10 cases are not reported

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Colon and Rectum Age-Specific Incidence Rate by Sex



Cancer of the Kidney and Renal Pelvis

Number of Cases and Age-adjusted Rates By Sex and Race

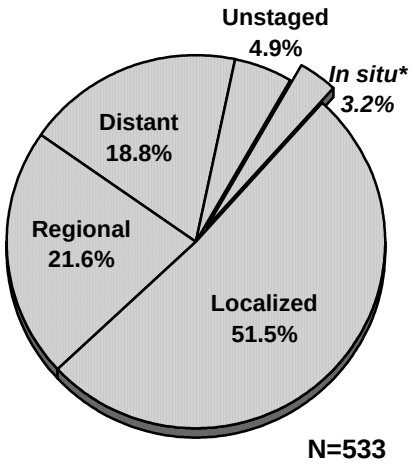
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	516	7.1	265	3.6
Male	318	9.7	168	5.3
Female	198	4.9	97	2.2
White	401	6.8	209	3.5
Black	105	8.9	53	4.4
Other	9	†	3	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

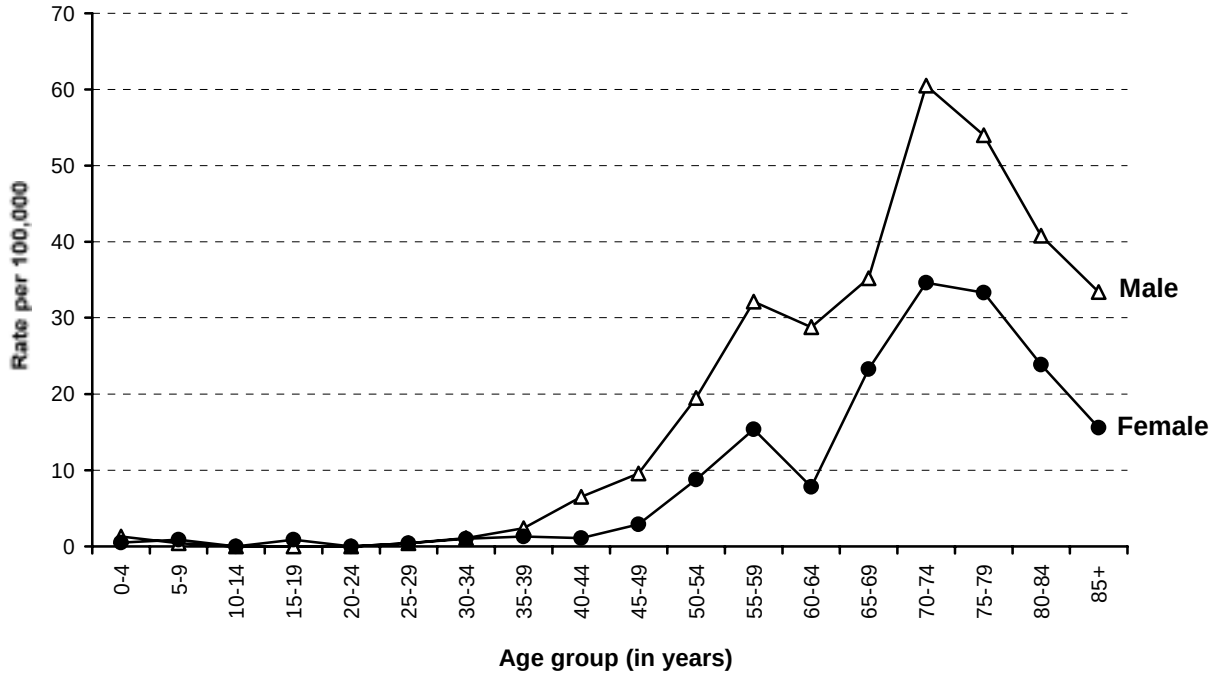
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Kidney and Renal Pelvis Age-Specific Incidence Rate by Sex



Cancer of the Lung and Bronchus

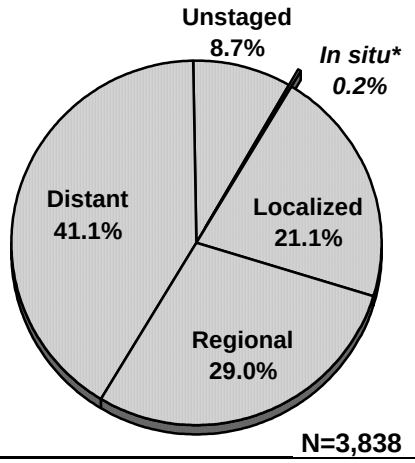
Number of Cases and Age-Adjusted Rates By Sex and Race

	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	3,832	53.4	3,807	52.1
Male	2,332	74.4	2,335	74.9
Female	1,500	37.5	1,472	35.5
White	3,094	52.8	3,060	51.1
Black	682	60.0	715	61.9
Other	48	28.2	32	21.0

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

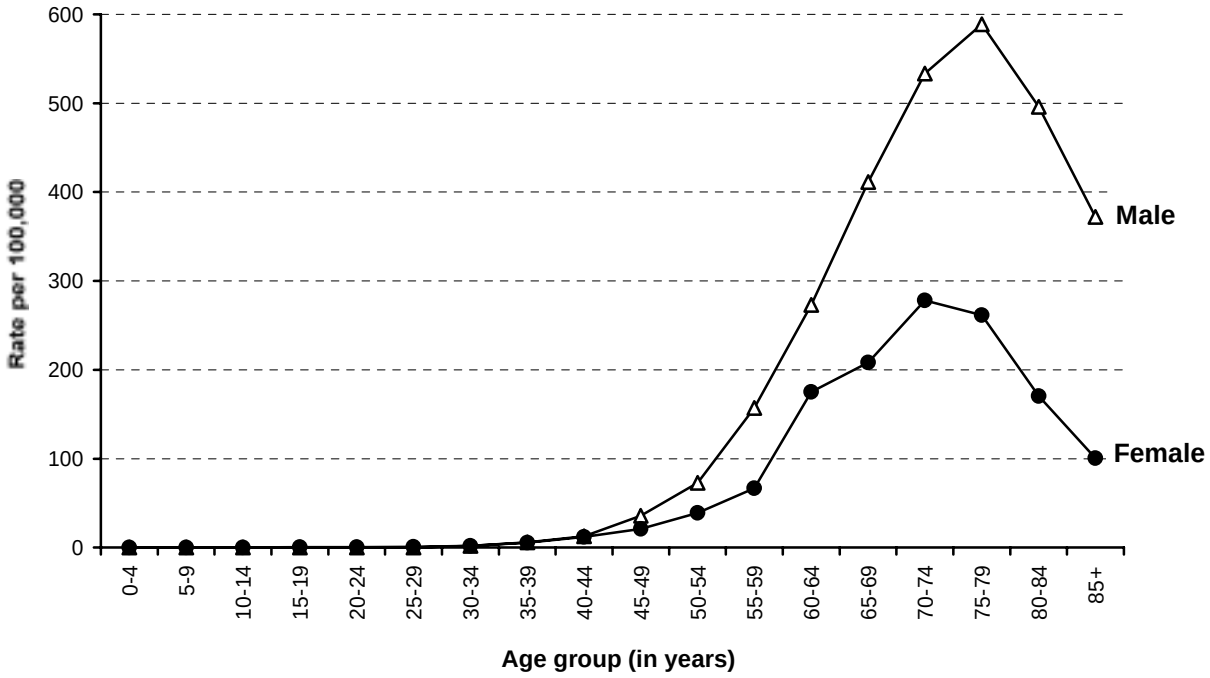
Total figures include persons of unknown race.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Lung and Bronchus Age-Specific Incidence Rate by Sex



Melanoma of the Skin‡

Number of Cases and Age-Adjusted Rates By Sex and Race

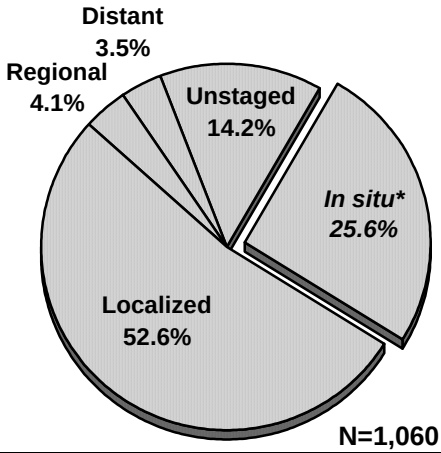
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	789	10.3	177	2.3
Male	423	12.5	98	3.0
Female	366	8.8	79	1.9
White	723	11.8	171	2.8
Black	13	1.1	5	†
Other	3	†	1	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ melanomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

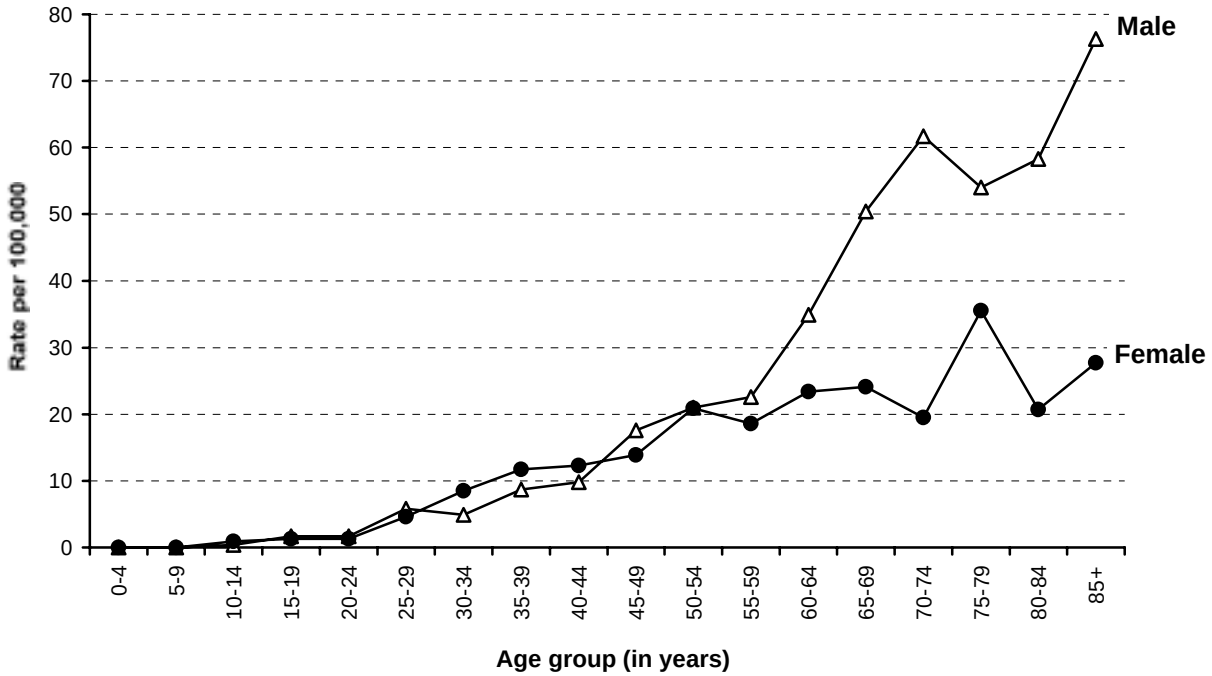
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Melanoma of the Skin Age-Specific Incidence Rate by Sex



‡**Data exclude basal and squamous cell skin cancers.**

Non-Hodgkin's Lymphoma

Number of Cases and Age-Adjusted Rates By Sex and Race

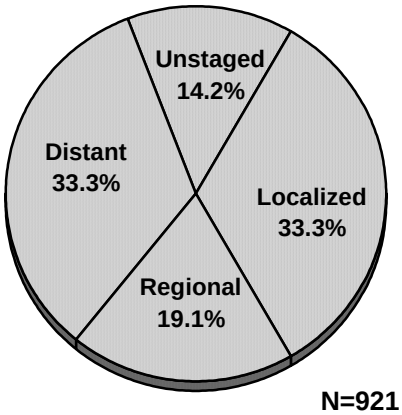
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	921	12.4	496	6.5
Male	500	15.1	238	7.4
Female	421	10.1	258	5.8
White	767	12.7	414	6.6
Black	130	10.4	79	6.4
Other	19	11.1	3	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

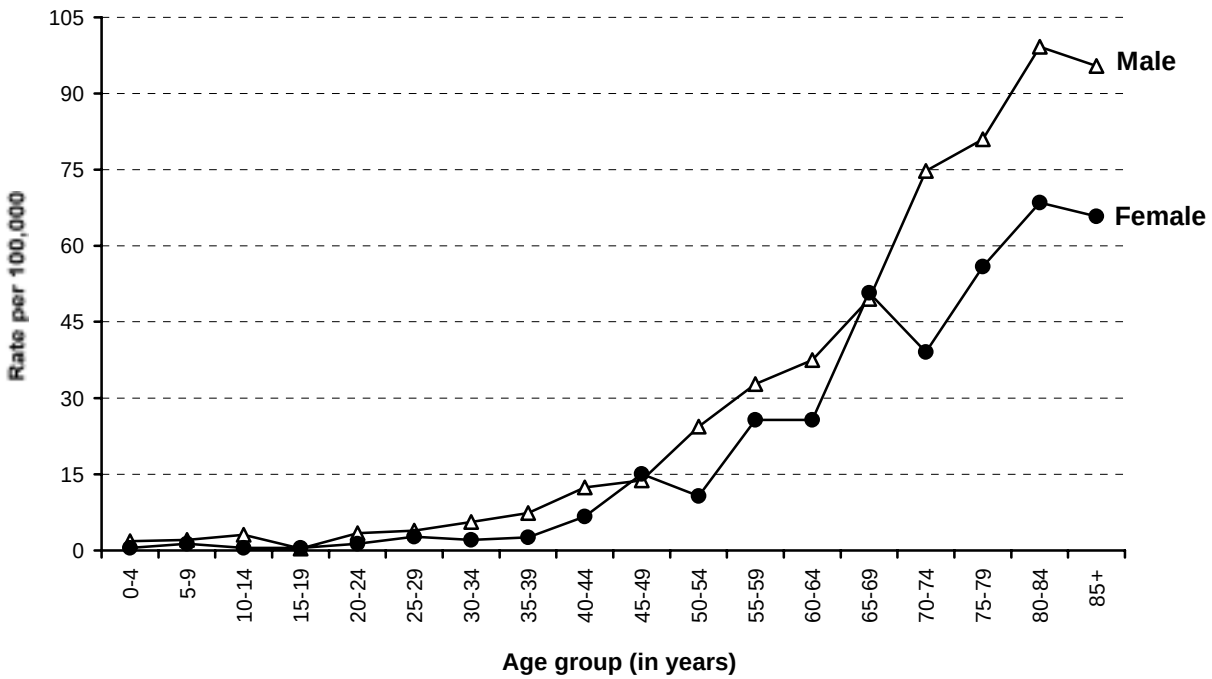
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



N=921

Non-Hodgkin's Lymphoma Age-Specific Incidence Rate by Sex



Cancer of the Oral Cavity and Pharynx

Number of Cases and Age-Adjusted Rates By Sex and Race

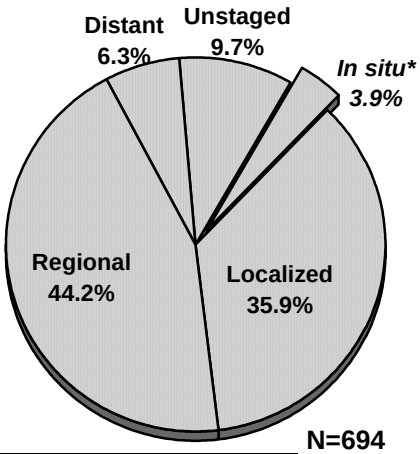
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	667	9.2	198	2.7
Male	418	12.9	137	4.3
Female	249	6.2	61	1.4
White	512	8.7	143	2.4
Black	141	12.2	52	4.3
Other	11	5.0	3	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

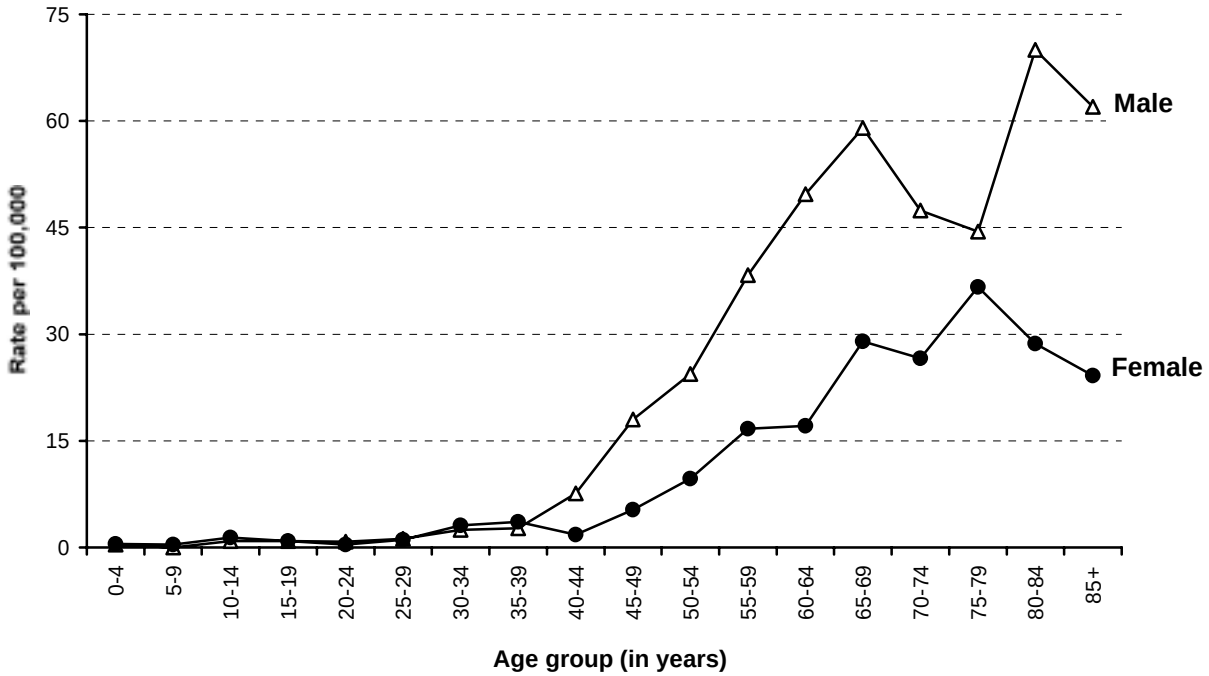
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Oral Cavity and Pharynx Age-Specific Incidence Rate by Sex



Prostate Cancer

Number of Cases and Age-Adjusted Rates By Sex and Race

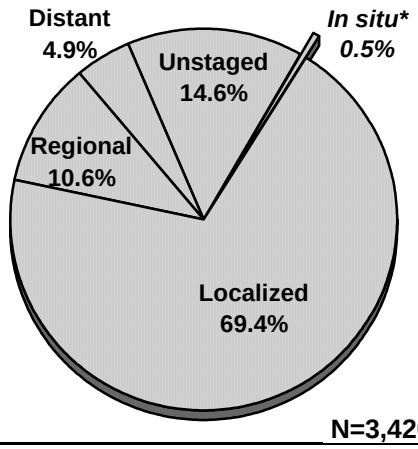
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	3,404	111.1	831	27.1
White	2,520	99.7	573	22.5
Black	788	169.1	252	53.8
Other	52	81.2	6	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data exclude in situ carcinomas. All rates are per 100,000 male population and are adjusted to 1970 U.S. standard population.

Total figures include persons of unknown race.

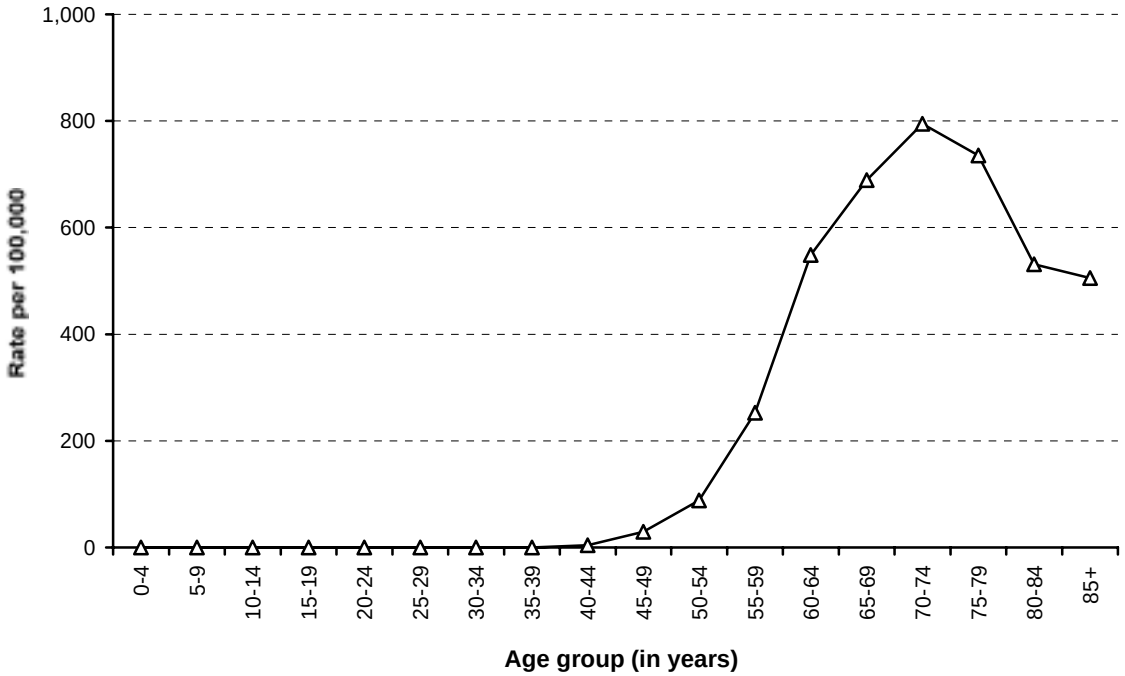
† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Prostate Cancer Age-Specific Incidence Rate



Cancer of the Urinary Bladder

Number of Cases and Age-Adjusted Rates By Sex and Race

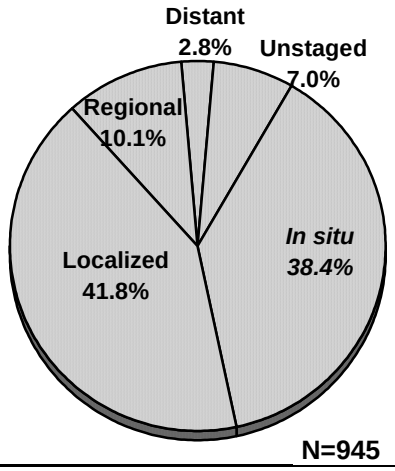
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	945	12.7	233	2.9
Male	688	22.0	147	4.8
Female	257	5.8	86	1.7
White	811	13.3	198	3.0
Black	121	10.2	35	2.7
Other	9	†	0	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Incidence data include in situ carcinomas. All rates are per 100,000 population and are adjusted to 1970 U.S. standard population.

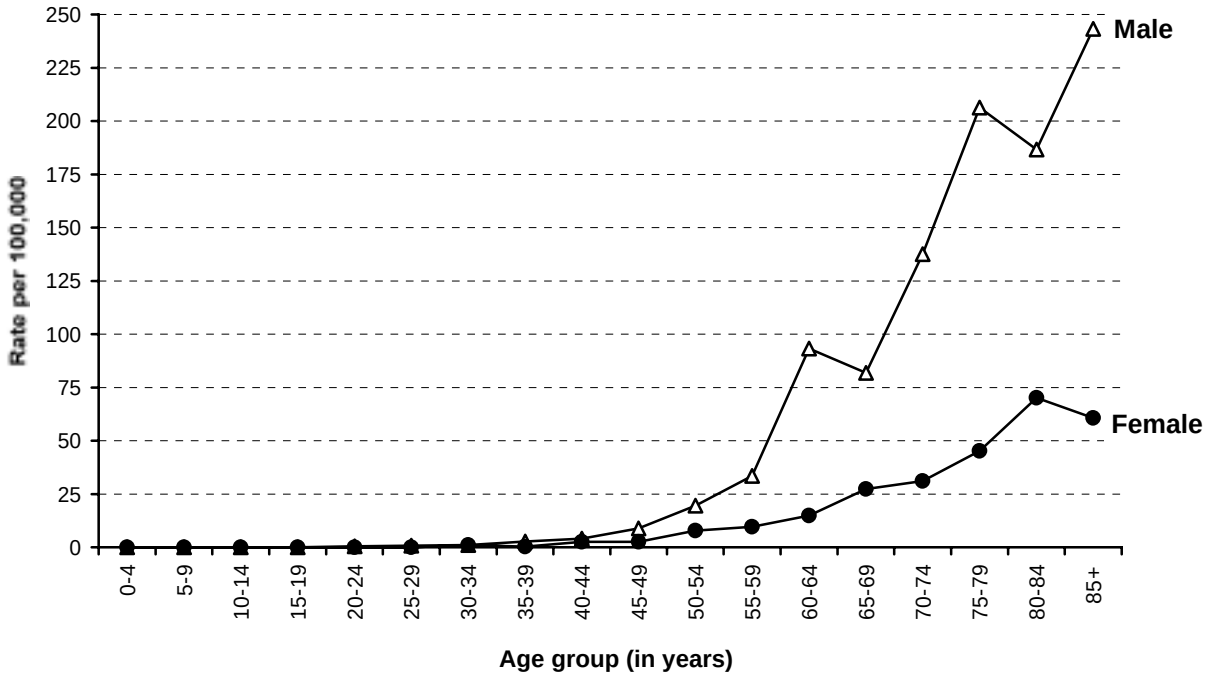
Total figures include persons of unknown race.

† Rates based on fewer than 10 cases are not reported

Percentage of Cases By Stage at Diagnosis



Cancer of the Urinary Bladder Age-Specific Incidence Rate by Sex



Cancer of the Uterus

Number of Cases and Age-Adjusted Incidence Rate for Invasive Cancer By Sex, Race, and Year of Diagnosis

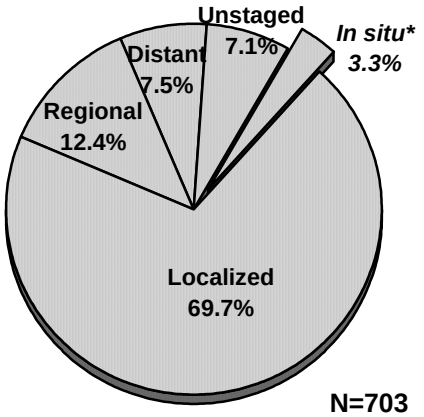
	Incidence		Mortality	
	Cases	Rate	Deaths	Rate
Total	680	17.1	139	3.1
White	557	17.5	102	2.7
Black	102	14.9	35	4.9
Other	15	11.0	2	†

Note. Mortality data were obtained from the Virginia Center for Health Statistics (VCHS). Rates are per 100,000 female population and are adjusted to 1970 U.S. standard population. Data exclude in situ carcinomas.

Total figures include persons of unknown race.

† Rates based on fewer than 10 cases are not reported because they are unreliable.

Percentage of Cases By Stage at Diagnosis



*These in situ cancers have been excluded from all rates presented.

Invasive Cancer of the Uterus Age-Specific Incidence Rate

Section IV

Trends in Detection

Table 1. Stage at Diagnosis by Primary Site

Number of Cases and Annual Age-adjusted Incidence Rate by Stage, 1993 and 1997, and Five-year Average Annual Percent Change in Rate (1993 -1997)

	In situ		Localized		Regional		Distant	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate
All Sites Combined								
1993 (N=25,495)	2,296	31.66	9,920	145.46	5,580	82.01	5,002	74.00
1997 (N=26,771)	2,847	37.39	10,747	147.08	5,840	79.55	4,542	62.73
Average Annual % Change		*4.3*		*0.29*		*(0.70)*		*(3.96)*
Female Breast								
1993 (N=4,094)	579	15.82	2,118	56.11	1,045	27.80	182	4.69
1997 (N=4,784)	732	18.63	2,547	62.85	1,108	27.36	185	4.55
Average Annual % Change		*4.49*		*2.89*		*(0.24)*		*(0.59)*
Cervix								
1993 (N=1,227)	926	23.33	170	4.34	87	2.24	25	0.66
1997 (N=1,263)	955	23.45	160	3.75	96	2.32	26	0.63
Average Annual % Change		*0.16*		*(2.62)*		*1.07*		*(0.36)*
Colon and Rectum								
1993 (N=2,989)	210	3.11	736	10.71	1,313	18.90	552	8.06
1997 (N=3,193)	274	3.79	897	11.97	1,331	17.74	501	6.82
Average Annual % Change		*5.51*		*3.3*		*(1.42)*		*(3.91)*
Kidney and Renal Pelvis								
1993 (N=492)	8	†	297	4.41	75	1.14	100	1.52
1997 (N=533)	17	0.23	275	3.78	115	1.60	100	1.38
Average Annual % Change		†		*(3.01)*		*9.25*		*(1.45)*
Lung and Bronchus								
1993 (N=3,672)	6	†	774	11.64	971	14.79	1,654	24.93
1997 (N=3,838)	6	†	809	11.23	1,112	15.52	1,576	22.16
Average Annual % Change		†		*(0.62)*		*1.33*		*(2.87)*

Note. Negative changes in rates are denoted by parentheses. Small changes in observed counts may result in inflated percentage increases or decreases. Unstaged cases are reflected in annual total counts but not in stage-specific figures. Rates are per 100,000 population and are age-adjusted to the 1970 U.S. standard population.

†Rates based on fewer than 10 cases are not reported because they are unreliable.

Table 1 (continued). Stage at Diagnosis by Primary Site
Number of Cases and Annual Age-adjusted Incidence Rate by Stage, 1993 and 1997, and Five-year Average Annual Percent Change in Rate (1993-1997)

	In situ		Localized		Regional		Distant	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Melanoma of the Skin								
1993 (N=717)	146	2.10	368	5.18	28	0.40	34	0.47
1997 (N=1,060)	271	3.59	559	7.32	43	0.56	37	0.49
Average Annual % Change		*16.24*		*9.39*		*12.92*		*7.45*
Non-Hodgkin's Lymphoma								
1993 (N=792)	0	0.00	229	3.30	153	2.13	319	4.62
1997 (N=921)	0	0.00	307	4.17	176	2.36	307	4.10
Average Annual % Change		*0.00*		*6.15*		*2.61*		*(2.59)*
Oral Cavity and Pharynx								
1993 (N=633)	8	†	227	3.36	291	4.43	58	0.91
1997 (N=694)	27	0.37	249	3.40	307	4.27	44	0.61
Average Annual % Change		†		*0.32*		*(0.56)*		*(7.12)*
Prostate								
1993 (N=4,039)	7	†	2,457	85.96	561	19.77	309	11.13
1997 (N=3,420)	16	0.51	2,373	77.46	363	11.91	167	5.42
Average Annual % Change		†		*(2.49)*		*(11.31)*		*(15.99)*
Urinary Bladder								
1993 (N=965)	242	3.58	511	7.45	89	1.27	44	0.61
1997 (N=945)	363	4.93	395	5.31	95	1.27	26	0.33
Average Annual % Change		*8.50*		*(7.99)*		*0.22*		*(9.66)*
Uterus								
1993 (N=636)	18	0.46	437	12.07	87	2.33	59	1.58
1997 (N=703)	23	0.61	490	12.46	87	2.13	53	1.31
Average Annual % Change		*10.66*		*1.12*		*(1.23)*		*(2.59)*

Note. Negative changes in rates are denoted by parentheses. Small changes in observed counts may result in inflated percentage increases or decreases. Unstaged cases are reflected in annual total counts but not in stage-specific figures. Rates are per 100,000 population and are age-adjusted to the 1970 U.S. standard population.
†Rates based on fewer than 10 cases are not reported because they are unreliable.

Section V

Appendices

Appendix A: Technical Notes

These data reflect a conservative account of cancer in Virginia for several reasons. Residents sometimes travel out-of-state for diagnosis and treatment. Data on cancer in Virginia residents diagnosed or treated in the neighboring states of Kentucky, Maryland, West Virginia, North Carolina, or the District of Columbia are collected from the central registries in those states through legal interstate data exchange agreements. Virginia does not have an exchange agreement with Tennessee, and Virginia residents diagnosed and treated in Tennessee are not included in these data. Further, some patients may have been missed by the routine casefinding methods used in the reporting facilities. These factors combined lead to biases in the cases that are reported. Underreporting of cancer occurs to varying degrees in different areas of the state; for example, counts may be more accurate in urbanized areas simply because case ascertainment is more complete. Similarly, case reporting may be more complete for certain racial groups, cancer sites, or diagnosis stages.

Appendix B: SEER Definition of Site Categories

Site Categories	ICD-O-2 Codes*	ICD-9 Codes
Oral Cavity and Pharynx	C00.0 - C14.8	140.0 - 145.6 145.8 - 145.9 146.0 - 149.9
Esophagus	C15.0 - C15.9	150.0 - 150.9
Stomach	C16.0 - C16.9	151.0 - 151.9
Colon and Rectum	C18.0 - C18.9, C19.9, C20.9, C21.0 - C21.8	153.0 - 153.9, 154.0 - 154.1, 159.0
Liver and Intrahepatic Bile Duct	C22.0 - C22.1	155.0 - 155.2
Pancreas	C25.0 - C25.9	157.0 - 157.9
Larynx	C32.0 - C32.9	161.0 - 161.9
Lung and Bronchus	C34.0 - C34.9	162.2 - 162.9
Melanoma of the Skin	C44.0 - C44.9 (histologies 8720-8790 only)	172.0 - 172.9
Female Breast	C50.0 - C50.9	174.0 - 174.9
Cervix	C53.0 - C53.9	180.0 - 180.9
Uterus	C54.0 - C54.9, C55.9	179._, 182.0 - 182.1, 182.8
Ovary	C56.9	183.0
Prostate	C61.9	185._
Testis	C62.0 - C62.9	186.0 -186.9
Urinary Bladder	C67.0 - C67.9	188.0 - 188.9
Kidney and Renal Pelvis	C64.9, C65.9	189.0 - 189.1
Brain and Other Nervous System	C70.0 - C70.9, C71.0 - C71.9, C72.0 - C72.9,	191.0 - 191.9 192.0 - 192.3, 192.8 - 192.9
Thyroid	C73.9	193._
Hodgkin's Lymphoma	Histologies 9650-9667	201.0 - 201.9
Non-Hodgkin's Lymphoma	Histologies 9590-9595, 9670-9717	200.0 - 200.8, 202.0 - 202.2, 202.8 - 202.9
Multiple Myeloma	Histologies 9731-9732	203.0, 203.2 - 203.8
Leukemia	Histologies 9800-9804, 9820-9827, 9830-9831, 9840-9842, 9850, 9860-9864, 9866-9868, 9870- 9874, 9880, 9890-9894, 9900, 9910, 9930-9941	202.4, 203.1, 204.0 -207.2, 207.8 -207.9 208.0 -208.9

*Except where noted or otherwise specified, each grouping excludes histologic types 9590-9989.

Appendix C: U.S. Standard Population, 1970

Age Group (years)	Count
0 to 4	84,416
5 to 9	98,204
10 to 14	102,304
15 to 19	93,845
20 to 24	80,561
25 to 29	66,320
30 to 34	56,249
35 to 39	54,656
40 to 44	58,958
45 to 49	59,622
50 to 54	54,643
54 to 59	49,077
60 to 64	42,403
65 to 69	34,406
70 to 74	26,789
75 to 79	18,871
80 to 84	11,241
85 plus	7,435
TOTAL	1,000,000

Note. The U.S. standard population, 1970, is used for the age-adjustment of observed age-specific incidence rates and does not represent an actual population estimate.

Appendix D:
Virginia Population, 1997, By Race and Sex

	1997	
Race	Male	Female
All Races	3,291,792	3,445,697
White	2,528,600	2,612,074
Black	643,052	700,120
Other	120,140	133,503

Note. Population estimates are from the U.S. Census Bureau (release date September 15, 1999). Annual race-, sex-, and age-specific population estimates for each locality were summed to produce population estimates for the state and health district. These figures were used as population-at-risk figures in the denominator in calculation of age-specific and age-adjusted incidence rates.

Appendix E:
Publications and Journal Articles using Virginia Cancer Registry Data

Publications:

Cancer Incidence in Virginia, 1995-1996
Cancer Incidence in Virginia, 1990-1994
Laryngeal Cancer in Virginia, 1970-1996
Melanoma in Virginia, 1970-1996
Prostate Cancer in Virginia, 1970-1997

Articles:

1999

Desch CE, Penberthy LT, Hillner BE, McDonald MK, Smith TJ, Pozez AL, Retchin SM. A Sociodemographic and Economic Comparison of Breast Reconstruction, Mastectomy, and Conservative Surgery. Surgery. 125(4):441-7;1999.

Josephson GD, and Wohl D. Malignant Tumors of the Head and Neck in Children. Current Opinion in Otolaryngology & Head and Neck Surgery. 7(2):61-67;1999.

Whitehurst MM, Aldenderfer PH, Yanovich S, Strelkauskas AJ. Clinical Analysis of the Novel Breast Cancer Serum Assay BT1. Anticancer Research. 19(2A):1331-5;1999.

1998

Hillner BE, McDonald MK, Desch CE, Smith TJ, Penberthy LT, Retchin SM. A Comparison of Patterns of Care of Non-small Cell Lung Carcinoma Patients in a Younger and Medigap Commercially Insured Cohort. Cancer. 83(9):1930-7;1998.

Hillner BE, McDonald MK, Desch CE, Smith TJ, Penberthy LT, Maddox P, Retchin SM. Costs of Care Associated with Non-small Cell Lung Cancer in a Commercially Insured Cohort. Journal of Clinical Oncology. 16(4):1420-4;1998.

Newschaffer CJ, Bush TL, Penberthy LE, Bellantoni M, Helzlsour K, Diener-West M. Does Cormorbid Disease Interact with Cancer? An Epidemiologic Analysis of Mortality in a Cohort of Elderly Breast Cancer Patients. The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences. 53(5):M372-8;1998.

Woolard CD. The Detection and Treatment of Early Stage Breast Cancer, Virginia, 1986-1995. Virginia Epidemiology Bulletin. 98(12):1-5; 1998.

1997

Hillner BE, McDonald MK, Penberthy L, Desch CE, Smith TJ, Maddux P, Glasheen WP, Retchin SM. Measuring Standards of Care for Early Breast Cancer in an Insured Population. Journal of Clinical Oncology. 15(4):1401-8;1997.

Appendix E (continued): Publications and Journal Articles using Virginia Cancer Registry Data

McClish DK, Penberthy L, Whittemore M, Newschaffer C, Woolard D, Desch CE, Retchin S. Ability of Medicare Claims Data and Cancer Registries to Identify Cancer Cases and Treatment. American Journal of Epidemiology. 145(3):227-33; 1997.

Newschaffer CJ, Bush TL, Penberthy LT. Comorbidity Measurement in Elderly Female Breast Cancer Patients with Administrative and Medical Records Data. Journal of Clinical Epidemiology. 50(6):725-33;1997.

1996

Desch CE, Penberthy L, Newschaffer CJ, Hillner BE, Whittemore M, McClish D, Smith TJ, Retchin SM. Factors that Determine the Treatment for Local and Regional Prostate Cancer. Medical Care. 34(2):152-62;1996.

Hillner BE, et al. Development of a Quality of Care Scorecard for Early Breast Cancer in an Insured Population. Proceedings of the Annual Meeting of the American Society of Clinical Oncologists. 15:A157; 1996.

Hillner BE, Penberthy L, Desch CE, McDonald MK, Smith TJ, Retchin SM. Variation in Staging and Treatment of Local and Regional Breast Cancer in the Elderly. Breast Cancer Research and Treatment. 40(1):75-86; 1996.

Newschaffer CJ, Penberthy L, Desch CE, Retchin SM, Whittemore M. The Effect of Age and Comorbidity in the Treatment of Elderly Women with Nonmetastatic Breast Cancer. Archives of Internal Medicine. 156(1):85-90;1996.

1995

Smith TJ, Penberthy L, Desch CE, Whittemore M, Newschaffer C, Hillner BE, McClish D, Retchin SM. Differences in Initial Treatment Patterns and Outcomes of Lung Cancer in the Elderly. Lung Cancer. 13(3):235-52; 1995.